China

FCC - TEST REPORT

Report Number	:	60.792.17.022.02R01	Date of Issue	:	August 21, 2017
Model	:	HG02924			
Product Type	:	**Bluetooth Adapter**			
Applicant	:	Lidl US Trading, LLC			
Address	:	3500 S. Clark Street Arlington, Virginia, 22202			
Production Facility	:	DIGI MAX TECHNOLOGY LIMITED			
Address	:	Room 708, Building 3, Xinyuan B area, Jinshan Industrial District, Fuzhou, China			
Test Result	:	■**Positive** ☐**Negative**			
Total pages including Appendices	:	41			

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1 Table of Contents

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2 Description of Equipment Under Test

Description of the Equipment Under Test

Product:	Bluetooth Adapter
Model no.:	HG02924
FCC ID:	2AJ9O-HG2924
Rating:	1) 3.7VDC (1 x 3.7VDC Rechargeable battery) 2) 5.0VDC (USB port)
Frequency:	2402MHz-2480MHz
Antenna gain:	0 dBi
Number of operated channel:	79
Modulation:	GFSK

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3 Summary of Test Standards

Test Standards
FCC Part 15 Subpart C 10-1-16 Edition Federal Communications Commission, PART 15 — Radio Frequency Devices, Subpart C — Unintentional Radiators

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4 Details about the Test Laboratory

Site 1

Company name: TÜV SÜD Hong Kong Ltd.
3/F, West Wing, Lakeside 2,
10 Science Park West Avenue,
Science Park, Shatin, Hong Kong

Site 2

Company name: TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch
Building 12&13 Zhiheng Wisdomland Business Park,
Nantou Checkpoint Road 2,
Shenzhen 518052, P.R.China
FCC Registration Number: 502708

Emission Tests	
Test Item	Test Site
FCC Part 15 Subpart C	
FCC Title 47 Part 15.205, 15.209 & 15.247(d) Spurious Radiated Emission	Site 2
FCC Title 47 Part 15.247(a)(1) 20dB & 99% Bandwidth	Site 2
FCC Title 47 Part 15.247(b) Peak Output Power	Site 2
FCC Title 47 Part 2.1051 & 15.247(d) Spurious Emissions at Antenna Terminals	Site 2
FCC Title 47 Part 15.247(d) 100kHz Bandwidth of band edges	Site 2
FCC Title 47 Part 15.247(a)(1) Minimum Number of Hopping Frequencies	Site 2
FCC Title 47 Part 15.247(a)(1) Minimum Hopping Channel Carrier Frequency Separation	Site 2
FCC Title 47 Part 15.247(a)(1) Average Time of Occupancy	Site 2
FCC Title 47 Part 15.203 & 15.247(b) Antenna Requirement	Site 2

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4.1 Test Equipment Site List

Radiated emission Test – Site 2

DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	CAL. DUE DATE
EMI Test Receiver	Rohde & Schwarz	ESR 26	101269	14-July-18
Trilog Super Broadband Test Antenna	Schwarzbeck	VULB 9163	707	14-July-18
Horn Antenna	Rohde & Schwarz	HF907	102294	14-July-18
Pre-amplifier	Rohde & Schwarz	SCU 18	102230	14-July-18
3m Semi-anechoic chamber	TDK	9X6X6	----	14-July-20

20dB & 99% Bandwidth, Peak Output Power, Spurious Emissions at Antenna Terminals, 100kHz Bandwidth of band edges, Min. No. of Hopping Frequencies, Min. Hopping Channel Carrier Frequency Separation and Average Time of Occupancy – Site 2

DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	CAL. DUE DATE
Signal Generator	Rohde & Schwarz	SMB100A	108272	07-July-18
Signal Analyzer	Rohde & Schwarz	FSV40	101030	07-July-18
Vector Signal Generator	Rohde & Schwarz	SMU 200A	105324	07-July-18
RF Switch Module	Rohde & Schwarz	OSP120/OSP-B157	101226/100851	07-July-18

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4.2 Measurement System Uncertainty

Measurement System Uncertainty Emissions

System Measurement Uncertainty	
Items	**Extended Uncertainty**
Uncertainty for Radiated Emission in 3m chamber 9kHz-30MHz	4.54dB
Uncertainty for Radiated Emission in 3m chamber 30MHz-1000MHz	Horizontal: 4.83dB; Vertical: 4.91dB;
Uncertainty for Radiated Emission in 3m chamber 1000MHz-25000MHz	Horizontal: 4.89dB; Vertical: 4.88dB;
Uncertainty for Conducted RF test	2.04dB

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5 Summary of Test Results

Emission Tests				
FCC Part 15 Subpart C				
Test Condition	Pages	Test Result		
		Pass	Fail	N/A
FCC Title 47 Part 15.205, 15.209 & 15.247(d) Spurious Radiated Emission	10-15	☒	☐	☐
FCC Title 47 Part 15.247(a)(2) 6dB & 99% Bandwidth	16-18	☒	☐	☐
FCC Title 47 Part 15.247(b) Peak Output Power	19-21	☒	☐	☐
FCC Title 47 Part 2.1051 & 15.247(d) Spurious Emissions at Antenna Terminals	22-24	☒	☐	☐
FCC Title 47 Part 15.247(d) 100kHz Bandwidth of band edges	25-28	☒	☐	☐
FCC Title 47 Part 15.247(a)(1) Min. No. of Hopping Frequencies	29	☒	☐	☐
FCC Title 47 Part 15.247(a)(1) Min. of Hopping Channel Carrier Frequency Separation	30	☒	☐	☐
FCC Title 47 Part 15.247(a)(1) Average Time of Occupancy	31	☒	☐	☐
FCC Title 47 Part 15.203 & 15.247(b) Antenna Requirement	32	☒	☐	☐

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6 General Remarks

Remarks

NIL

SUMMARY:

- All tests according to the regulations cited on page 5 were

■ - Performed

☐ - **Not** Performed

- The Equipment Under Test

■ - **Fulfills** the general approval requirements.

☐ - **Does not** fulfill the general approval requirements.

Sample Received Date: June 23, 2017

Testing Start Date: June 24, 2017

Testing End Date: August 11, 2017

- TÜV SÜD HONG KONG LTD. -

Reviewed by: Prepared by:

TSENG Chi Kit	CHAN Kwan Ho Alex
EMC Project Engineer	EMC Project Engineer

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7 Emission Test Results

7.1 Spurious Radiated Emission

EUT: HG02924
Op Condition: Operated, TX Mode (2402MHz)
Test Specification: FCC15.205, 15.209 & 15.247(d) Antenna: Horizontal
Comment: 3.7VDC
Remark: 9kHz to 25GHz

Test Result
☒ Passed
☐ Not Passed

Frequency	Result	Limit	Margin	Detector
MHz	dBµV/m	dBµV/m	dB	
45.358	23.07	40	-16.93	Quasi Peak
271.261	17.06	46	-28.94	Quasi Peak
423.982	20.75	46	-25.25	Quasi Peak
871.155	31.53	46	-14.47	Quasi Peak
1592.125	32.71	74	-41.29	Peak
1592.125	27.42	54	-26.58	Average
2506.000	47.49	74	-26.51	Peak
2506.000	41.86	54	-12.14	Average
3327.656	50.61	74	-23.39	Peak
3327.656	46.72	54	-7.28	Average
4803.750	38.55	74	-35.45	Peak
4803.750	32.85	54	-21.15	Average
7206.094	42.83	74	-13.83	Peak
7206.094	39.07	54	-14.93	Average

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Spurious Radiated Emission

EUT: HG02924
Op Condition: Operated, TX Mode (2402MHz)
Test Specification: FCC15.205, 15.209 & 15.247(d) Antenna: Vertical
Comment: 3.7VDC
Remark: 9kHz to 25GHz

Test Result
☒ Passed
☐ Not Passed

Frequency	Result	Limit	Margin	Detector
MHz	dBµV/m	dBµV/m	dB	
31.940	17.76	40	-22.24	Quasi Peak
45.250	22.42	40	-17.58	Quasi Peak
60.662	17.81	40	-22.19	Quasi Peak
871.155	32.97	46	-13.03	Quasi Peak
1594.687	36.39	74	-37.61	Peak
1594.687	31.22	54	-22.78	Average
2505.937	44.55	74	-29.45	Peak
2505.937	40.09	54	-13.91	Average
3327.656	48.61	74	-25.39	Peak
3327.656	42.92	54	-11.08	Average
4803.750	40.58	74	-33.42	Peak
4803.750	35.71	54	-18.29	Average
14937.656	47.01	74	-13.83	Peak
14937.656	42.24	54	-11.76	Average

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Spurious Radiated Emission

EUT: HG02924
Op Condition: Operated, TX Mode (2441MHz)
Test Specification: FCC15.205, 15.209 & 15.247(d) Antenna: Horizontal
Comment: 3.7VDC
Remark: 9kHz to 25GHz

Test Result
☒ Passed
☐ Not Passed

Frequency	Result	Limit	Margin	Detector
MHz	dBµV/m	dBµV/m	dB	
45.358	22.17	40	-17.83	Quasi Peak
108.300	12.65	43.5	-30.85	Quasi Peak
271.439	19.42	46	-26.58	Quasi Peak
423.918	23.67	46	-22.33	Quasi Peak
1592.187	35.23	74	-38.77	Peak
1592.187	29.95	54	-24.05	Average
2233.125	37.67	74	-36.33	Peak
2233.125	32.71	54	-21.29	Average
3327.656	49.92	74	-24.08	Peak
3327.656	45.17	54	-8.83	Average
4881.562	39.39	74	-34.61	Peak
4881.562	32.71	54	-21.29	Average
7322.343	45.06	74	-13.83	Peak
7322.343	41.06	54	-12.94	Average

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Spurious Radiated Emission

EUT: HG02924
Op Condition: Operated, TX Mode (2441MHz)
Test Specification: FCC15.205, 15.209 & 15.247(d) Antenna: Vertical
Comment: 3.7VDC
Remark: 9kHz to 25GHz

Test Result
☒ Passed
☐ Not Passed

Frequency	Result	Limit	Margin	Detector
MHz	dBµV/m	dBµV/m	dB	
45.448	20.55	40	-19.45	Quasi Peak
108.605	15.15	43.5	-28.35	Quasi Peak
271.636	19.84	46	-26.16	Quasi Peak
425.051	22.37	46	-23.63	Quasi Peak
1115.625	32.51	74	-41.49	Peak
1115.625	28.14	54	-25.86	Average
1599.687	31.08	74	-42.92	Peak
1599.687	27.63	54	-26.37	Average
3327.656	48.87	74	-25.13	Peak
3327.656	43.41	54	-10.59	Average
4881.562	40.89	74	-33.11	Peak
4881.562	35.62	54	-18.38	Average
11766.562	43.33	74	-13.83	Peak
11766.562	38.23	54	-15.77	Average

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Spurious Radiated Emission

EUT: HG02924
Op Condition: Operated, TX Mode (2480MHz)
Test Specification: FCC15.205, 15.209 & 15.247(d) Antenna: Horizontal
Comment: 3.7VDC
Remark: 9kHz to 25GHz

Test Result
☒ Passed
☐ Not Passed

Frequency	Result	Limit	Margin	Detector
MHz	dBµV/m	dBµV/m	dB	
45.350	21.65	40	-18.35	Quasi Peak
108.553	14.21	43.5	-29.29	Quasi Peak
271.925	20.03	46	-25.97	Quasi Peak
425.008	22.59	46	-23.41	Quasi Peak
1115.687	32.24	74	-41.76	Peak
1115.687	27.68	54	-26.32	Average
1592.062	35.62	74	-38.38	Peak
1592.062	30.23	54	-23.77	Average
3327.656	50.63	74	-23.37	Peak
3327.656	45.81	54	-8.19	Average
4959.375	35.56	74	-38.44	Peak
4959.375	31.07	54	-22.93	Average
15017.343	47.12	74	-13.83	Peak
15017.343	42.65	54	-11.35	Average

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Spurious Radiated Emission

EUT: HG02924
Op Condition: Operated, TX Mode (2480MHz)
Test Specification: FCC15.205, 15.209 & 15.247(d) Antenna: Vertical
Comment: 3.7VDC
Remark: 9kHz to 25GHz

Test Result
☒ Passed
☐ Not Passed

Frequency	Result	Limit	Margin	Detector
MHz	dBµV/m	dBµV/m	dB	
45.440	20.83	40	-19.17	Quasi Peak
108.110	15.07	43.5	-28.43	Quasi Peak
271.836	21.06	46	-24.94	Quasi Peak
425.156	21.94	46	-24.06	Quasi Peak
1066.500	28.52	74	-45.48	Peak
1066.500	23.71	54	-30.29	Average
1599.312	39.24	74	-34.76	Peak
1599.312	34.63	54	-19.37	Average
3327.656	48.53	74	-25.47	Peak
3327.656	43.29	54	-10.71	Average
4959.843	40.71	74	-33.29	Peak
4959.843	36.21	54	-17.79	Average
14975.625	47.19	74	-13.83	Peak
14975.625	42.82	54	-11.18	Average

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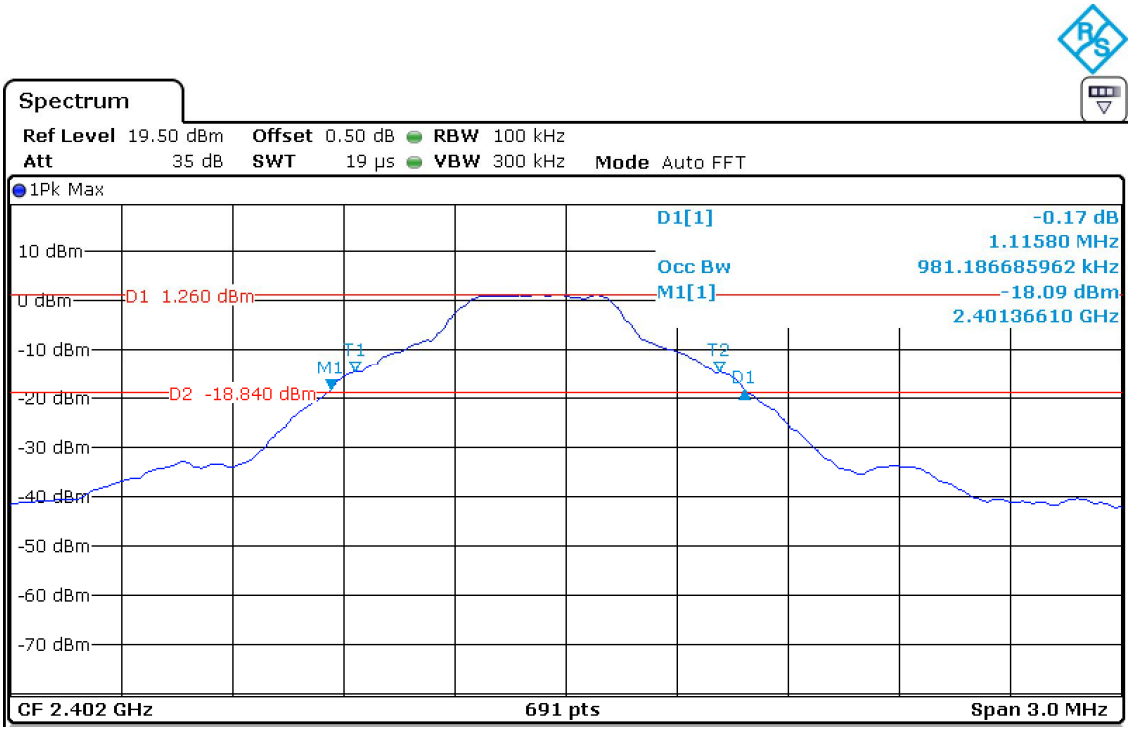
7.2 20dB & 99% Bandwidth

EUT:	HG02924
Op Condition:	Operated, TX Mode (2402MHz)
Test Specification:	FCC15.247(a)(2), 20dB Bandwidth & 99% Bandwidth
Comment:	3.7VDC

Test Result
☒ Passed
☐ Not Passed



20dB bandwidth	99% bandwidth
1115.800 kHz	981.186 kHz

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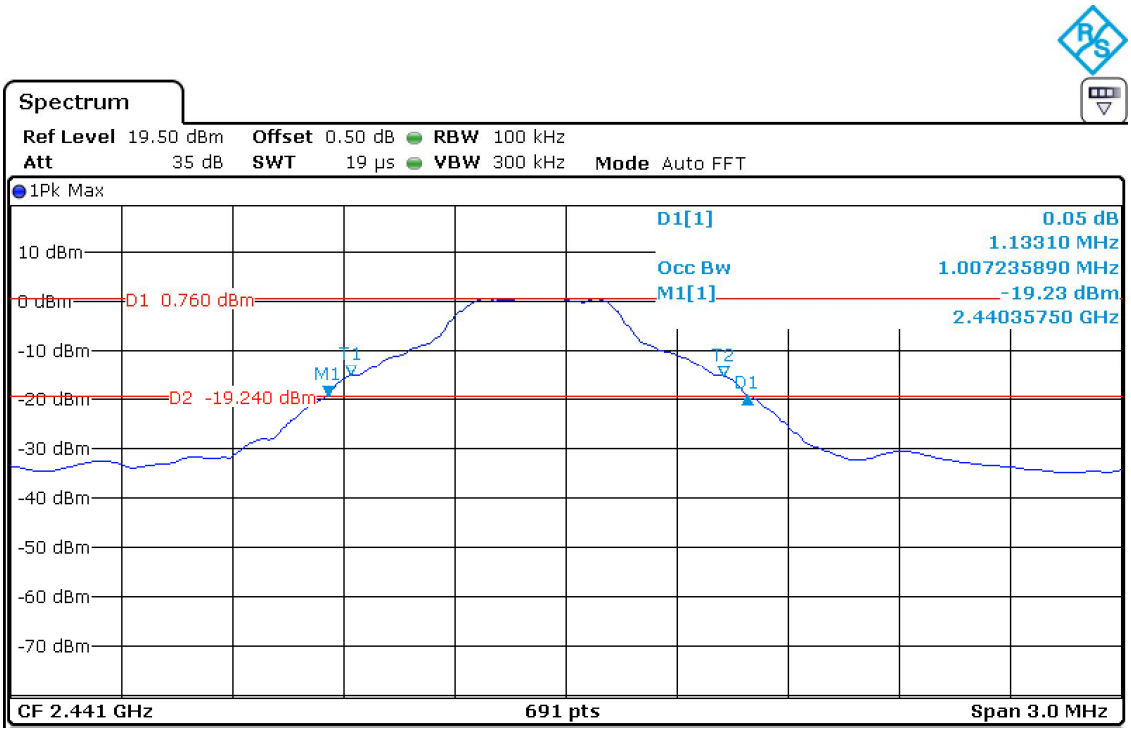
20dB & 99% Bandwidth

EUT:	HG02924
Op Condition:	Operated, TX Mode (2441MHz)
Test Specification:	FCC15.247(a)(2), 20dB Bandwidth & 99% Bandwidth
Comment:	3.7VDC

Test Result
☒ Passed
☐ Not Passed



20dB bandwidth	99% bandwidth
1133.100 kHz	1007.235 kHz

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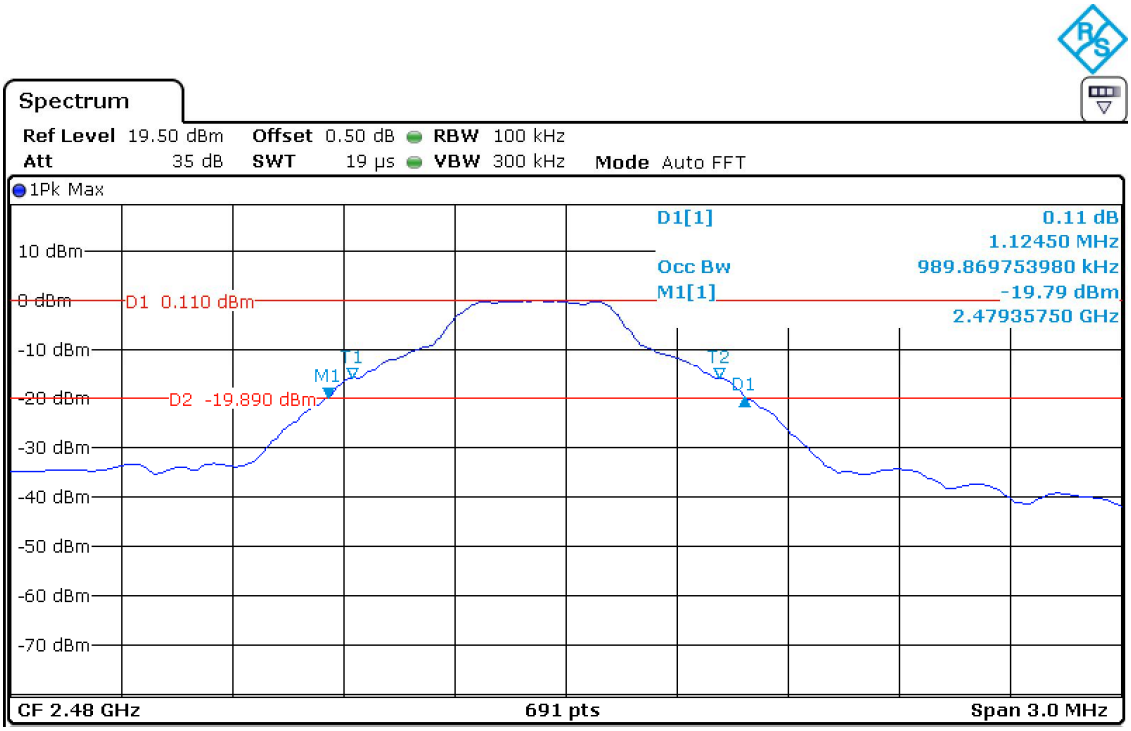
20dB & 99% Bandwidth

EUT:	HG02924
Op Condition:	Operated, TX Mode (2480MHz)
Test Specification:	FCC15.247(a)(2), 20dB Bandwidth & 99% Bandwidth
Comment:	3.7VDC

Test Result
☒ Passed
☐ Not Passed



20dB bandwidth	99% bandwidth
1124.500 kHz	989.869 kHz

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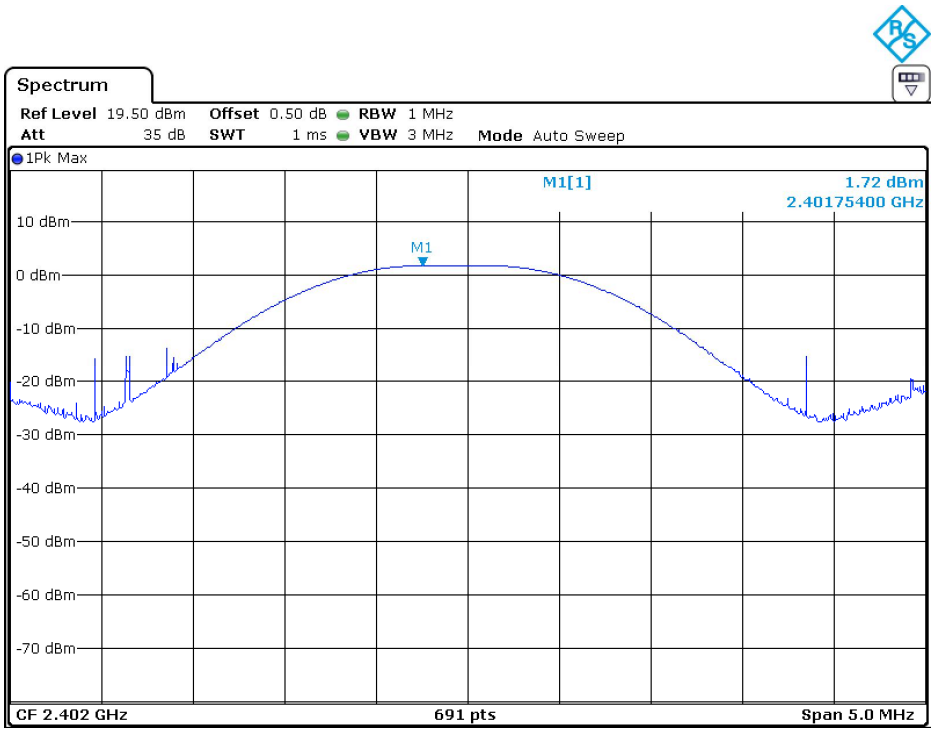
7.3 Peak Output Power

EUT:	HG02924
Op Condition:	Operated, TX Mode (2402MHz)
Test Specification:	FCC15.247(b)
Comment:	3.7VDC, Antenna gain: 0 dBi, Cable Loss: 0.5dB

Test Result
☒ Passed
☐ Not Passed



Conducted Output Power (dBm)	Conducted Output Power (mW)	Limit (mW)
1.72	1.485	125.0

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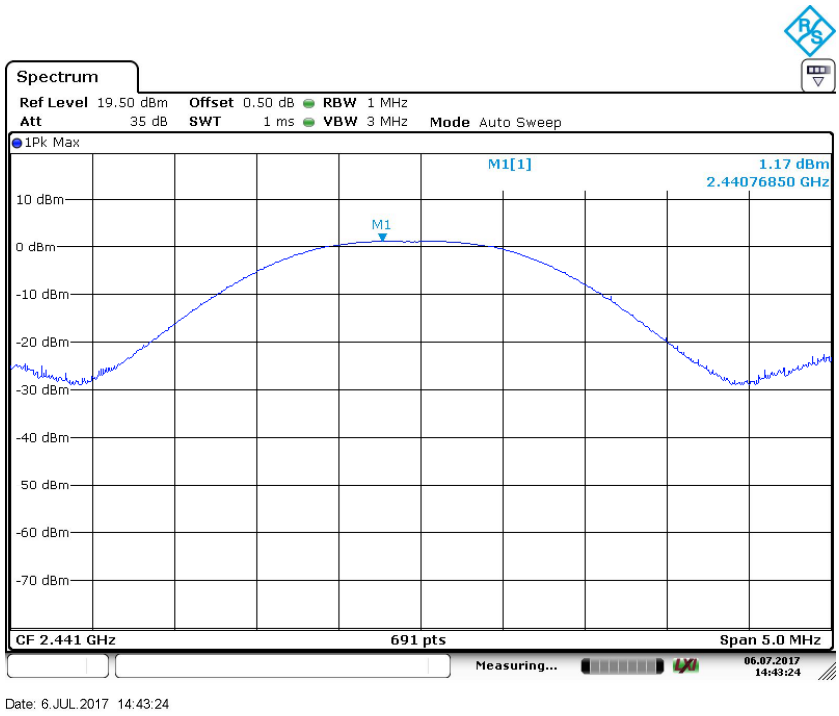
Peak Output Power

EUT:	HG02924
Op Condition:	Operated, TX Mode (2441MHz)
Test Specification:	FCC15.247(b)
Comment:	3.7VDC, Antenna gain: 0 dBi, Cable Loss: 0.5dB

Test Result
☒ Passed
☐ Not Passed



Date: 6.JUL.2017 14:43:24

Conducted Output Power (dBm)	Conducted Output Power (mW)	Limit (mW)
1.17	1.309	125.0

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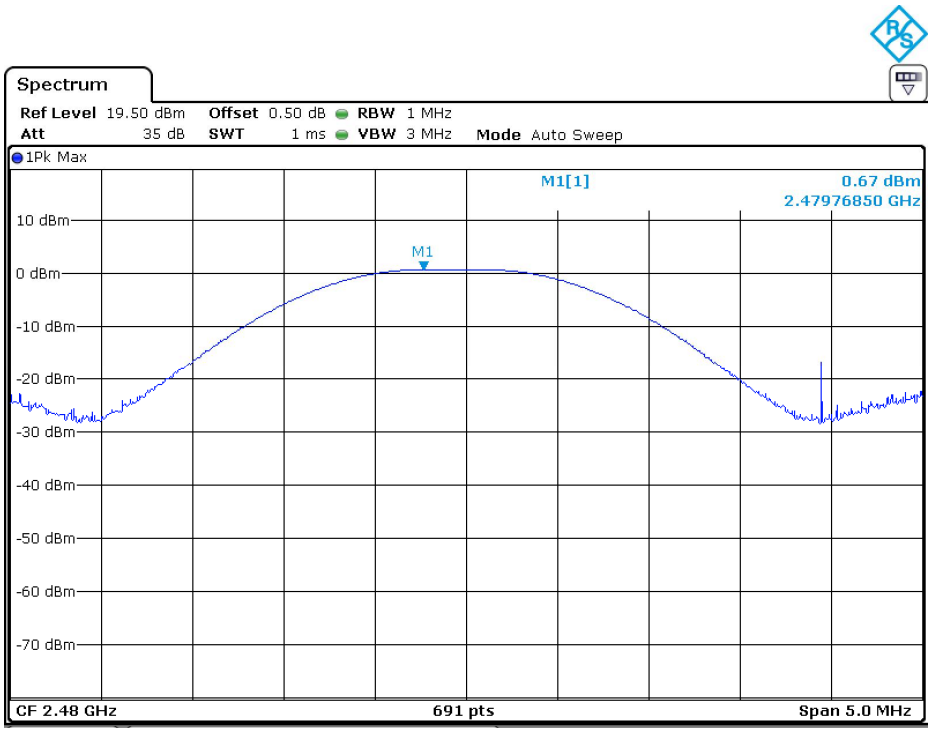
Peak Output Power

EUT:	HG02924
Op Condition:	Operated, TX Mode (2480MHz)
Test Specification:	FCC15.247(b)
Comment:	3.7VDC, Antenna gain: 0 dBi, Cable Loss: 0.5dB

Test Result
☒ Passed
☐ Not Passed



Conducted Output Power (dBm)	Conducted Output Power (mW)	Limit (mW)
0.67	1.167	125.0

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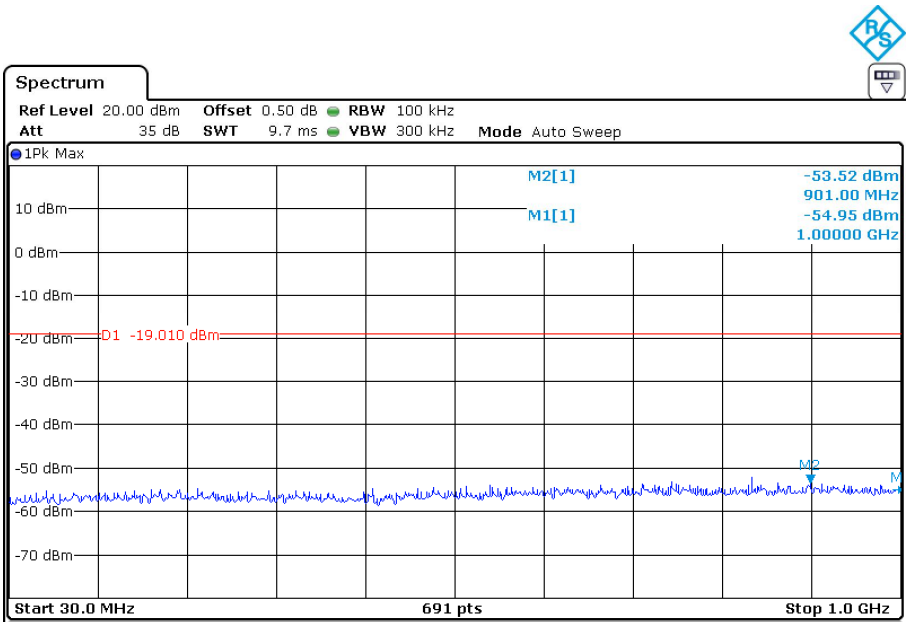
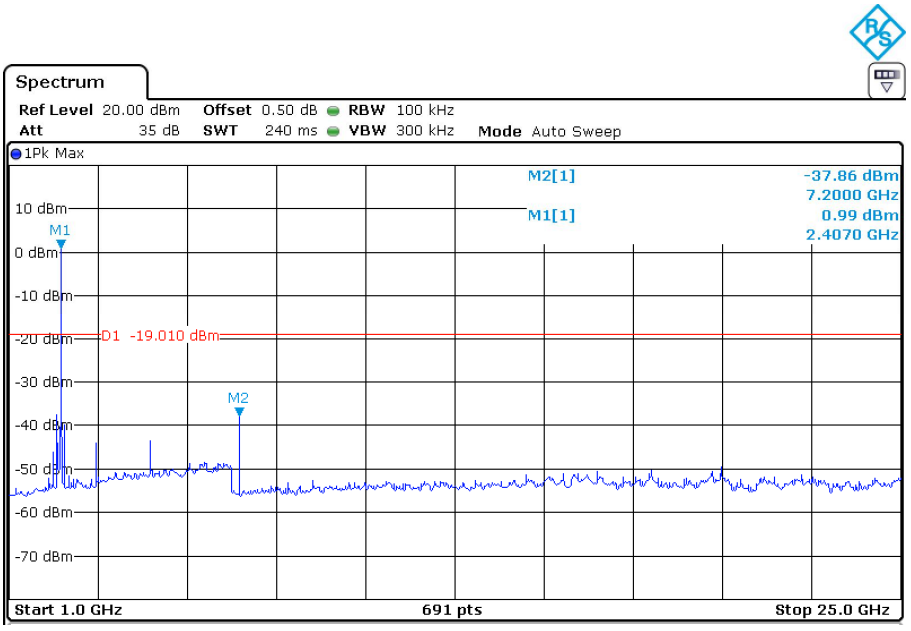
7.4 Spurious Emissions at Antenna Terminals

EUT:	HG02924
Op Condition:	Operated, TX Mode (2402MHz)
Test Specification:	FCC2.1051 & 15.247(d)
Comment:	3.7VDC

Test Result
☒ Passed
☐ Not Passed





Limit: 20dB below the highest level of the desired power in the passband

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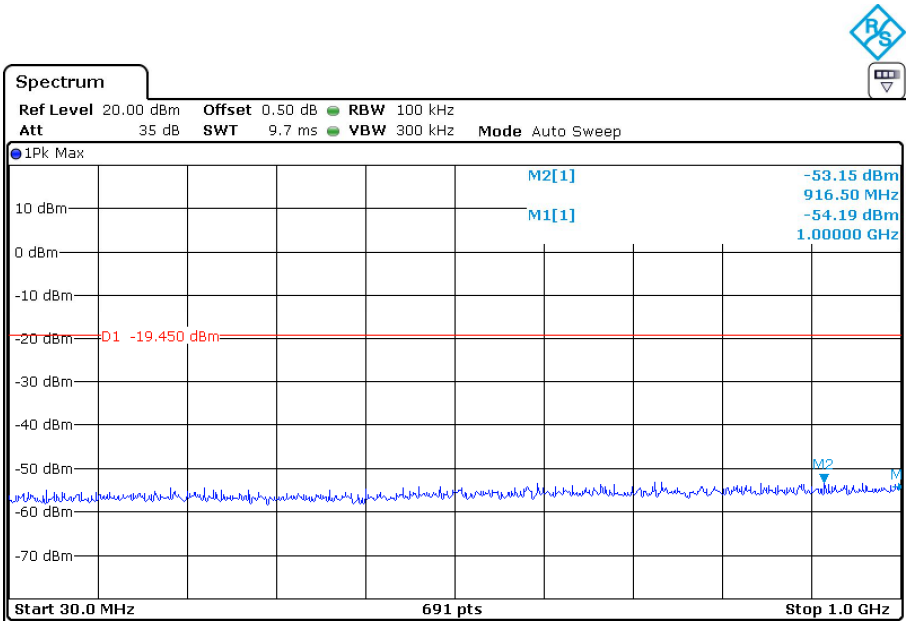
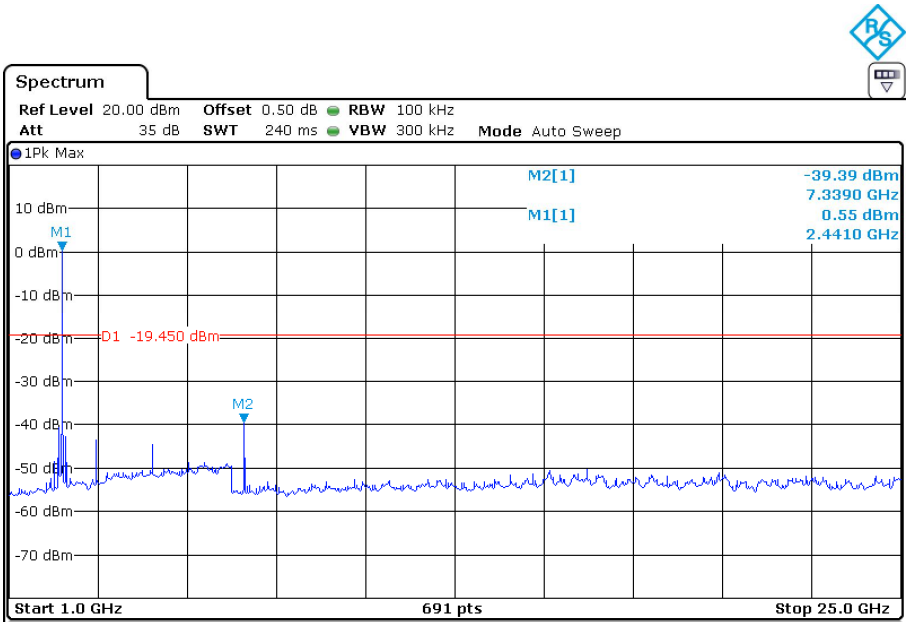
Spurious Emissions at Antenna Terminals

EUT: HG02924
Op Condition: Operated, TX Mode (2441MHz)
Test Specification: FCC2.1051 & 15.247(d)
Comment: 3.7VDC

Test Result
☒ Passed
☐ Not Passed





Limit: 20dB below the highest level of the desired power in the passband

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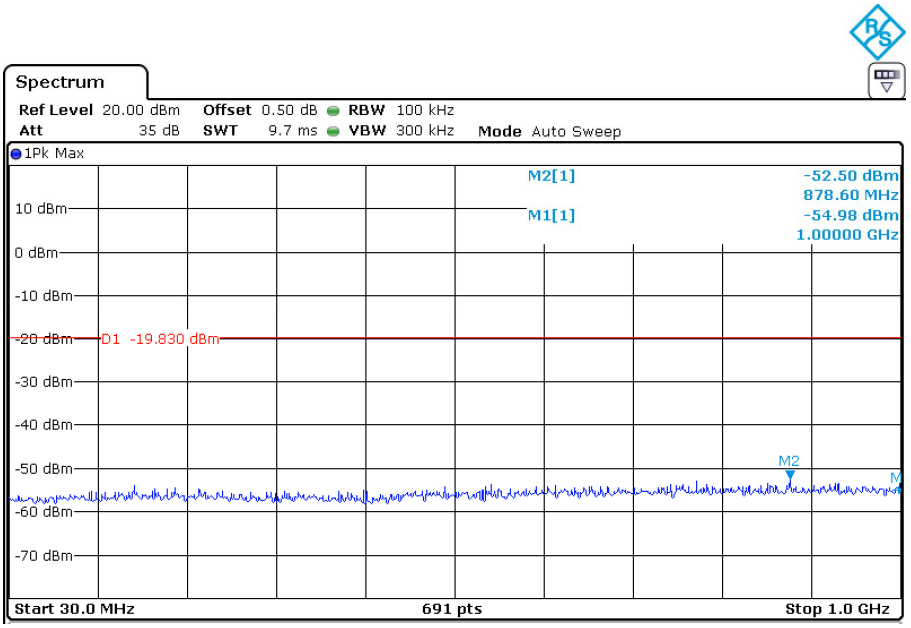
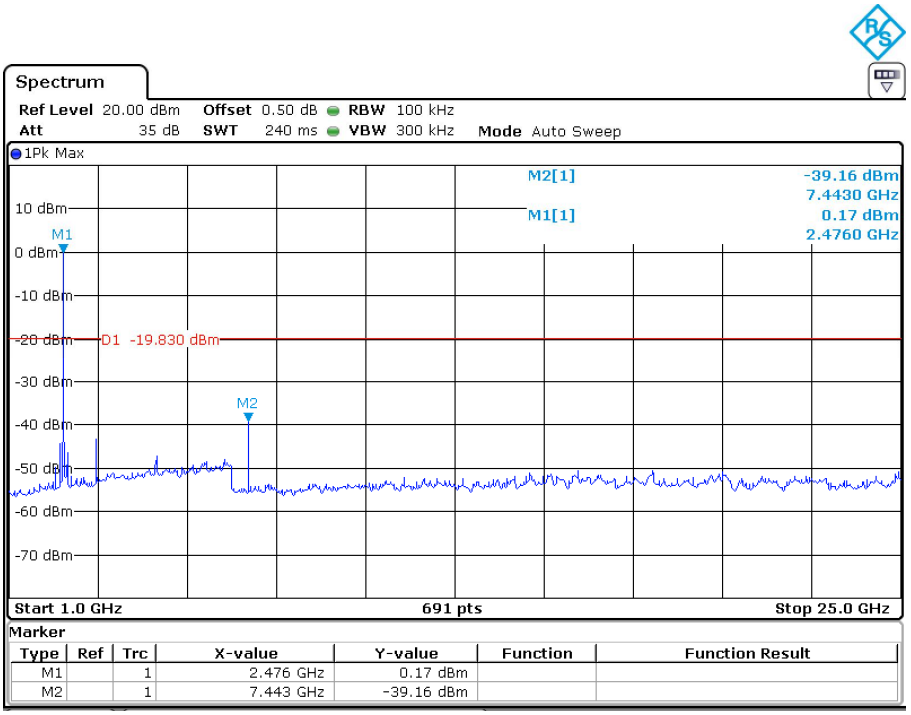
Spurious Emissions at Antenna Terminals

EUT:	HG02924
Op Condition:	Operated, TX Mode (2480MHz)
Test Specification:	FCC2.1051 & 15.247(d)
Comment:	3.7VDC

Test Result
☒ Passed
☐ Not Passed





Limit: 20dB below the highest level of the desired power in the passband

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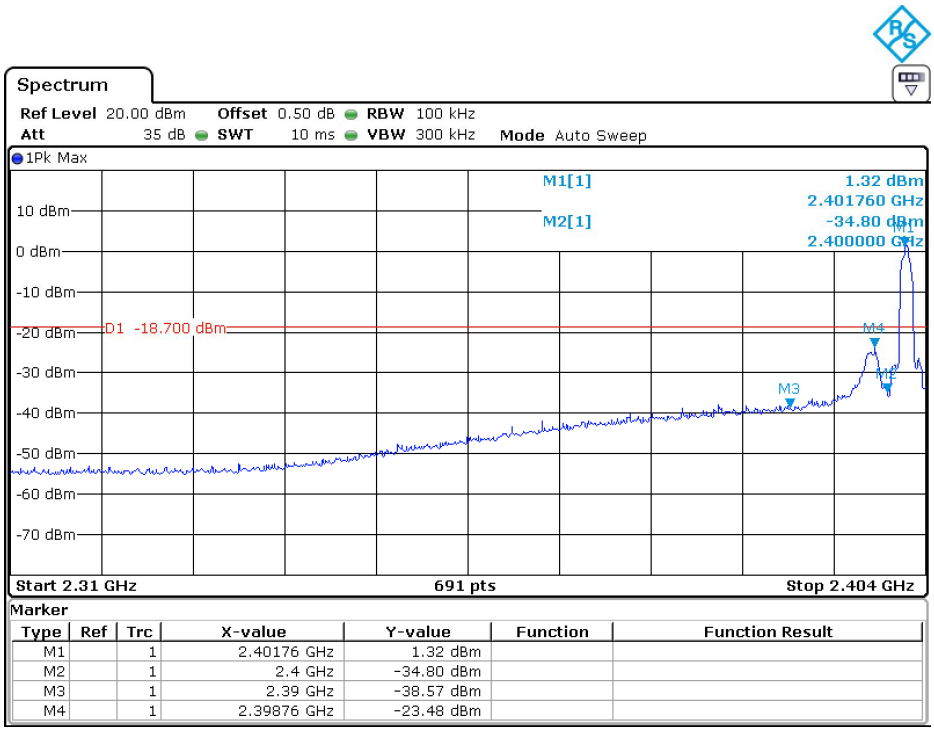
7.5 100kHz Bandwidth of band edges

EUT: HG02924
Op Condition: Operated, TX Mode (2402MHz)
Test Specification: FCC15.247(d), Conducted
Comment: 3.7VDC

Test Result
☒ Passed
☐ Not Passed



Band edges	Limit
39.89 dB	> 20dB

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100kHz Bandwidth of band edges

EUT: HG02924
Op Condition: Operated, TX Mode (2402MHz)
Test Specification: FCC15.247(d), Radiated
Comment: 3.7VDC

Test Result
☒ Passed
☐ Not Passed

Frequency MHz	Result dBµV/m	Limit dBµV/m	Margin dB	Detector
2390.000	55.66	74	-18.34	Peak
2390.000	46.28	54	-7.72	Average

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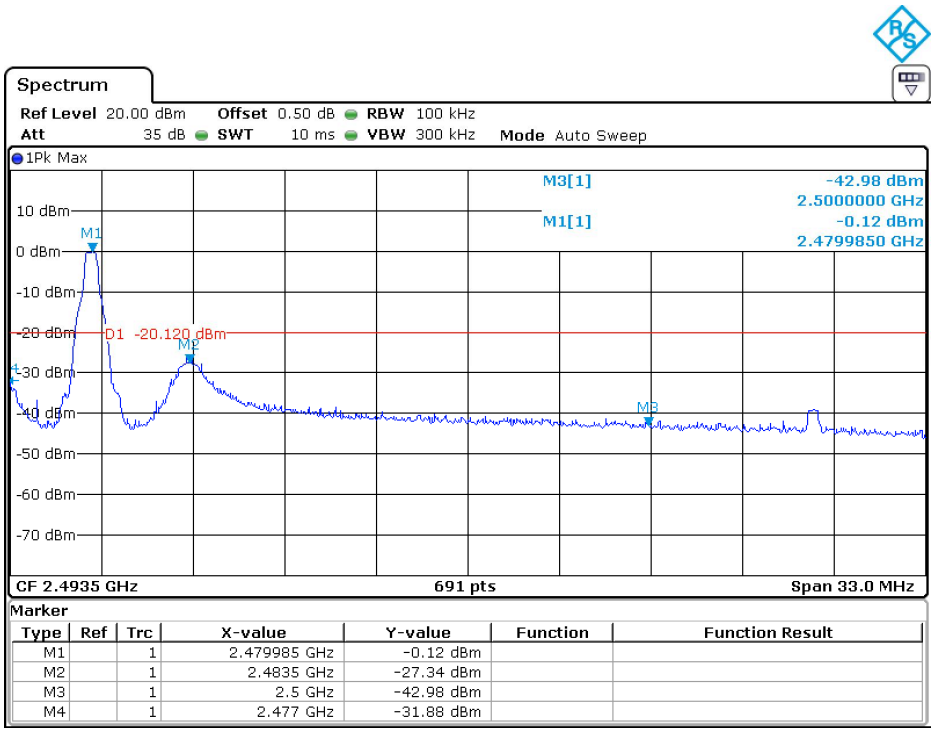
100kHz Bandwidth of band edges

EUT: HG02924
Op Condition: Operated, TX Mode (2480MHz)
Test Specification: FCC15.247(d), Conducted
Comment: 3.7VDC

Test Result
☒ Passed
☐ Not Passed



Band edges	Limit
27.22dB	> 20dB

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100kHz Bandwidth of band edges

EUT: HG02924
Op Condition: Operated, TX Mode (2480MHz)
Test Specification: FCC15.247(d), Radiated
Comment: 3.7VDC

Test Result
☒ Passed
☐ Not Passed

Frequency MHz	Result dBµV/m	Limit dBµV/m	Margin dB	Detector
2483.500	59.78	74	-22.84	Peak
2483.500	50.07	54	-3.93	Average

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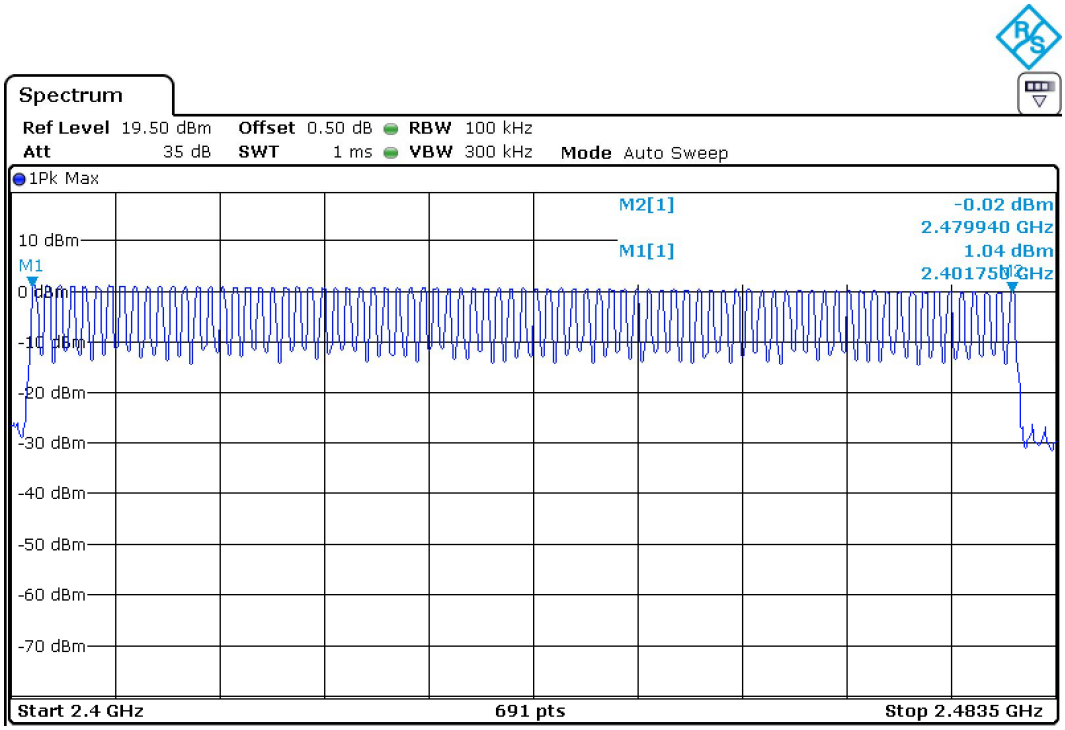
7.6 Minimum. Number of Hopping Frequencies

EUT: HG02924
Op Condition: Operated, TX Mode (2402-2480MHz)
Test Specification: FCC15.247(a)(1)
Comment: 3.7VDC

Test Result
☒ Passed
☐ Not Passed



Hopping Channels	Limit
79	≥ 15

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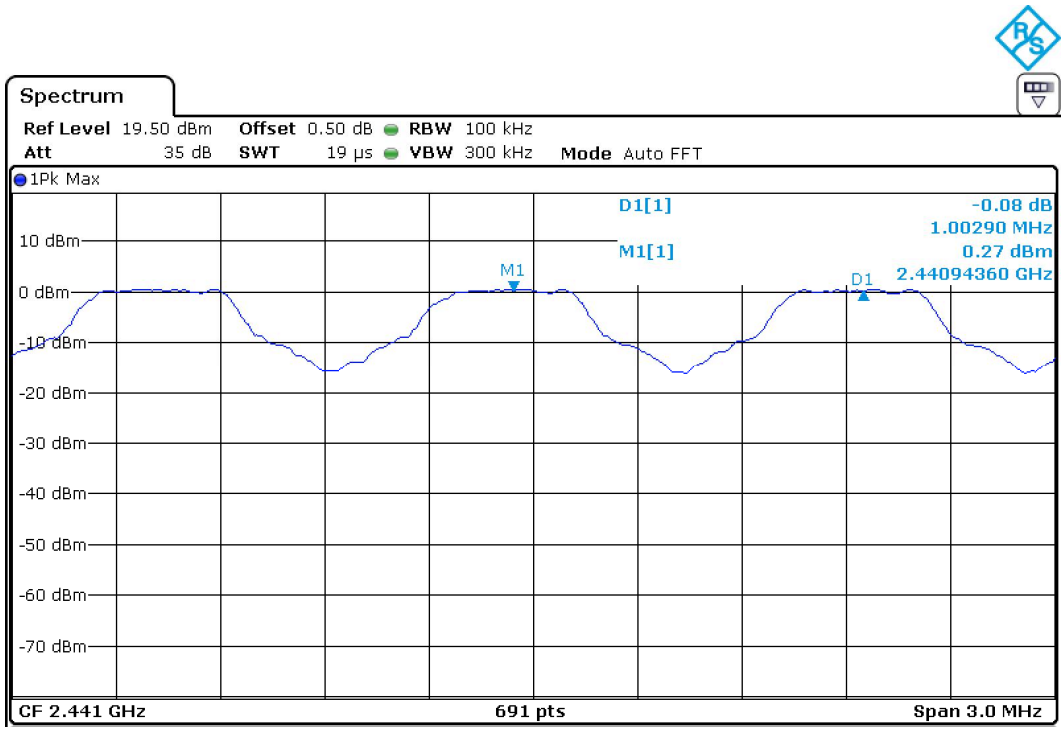
7.7 Minimum Hopping Channel Carrier Frequency Separation

EUT: HG02924
Op Condition: Operated, TX Mode (2402-2480MHz)
Test Specification: FCC15.247(a)(1)
Comment: 3.7VDC

Test Result
☒ Passed
☐ Not Passed



Chanel Separation	Limit
1002.900 kHz	755.4kHz

Limit: 2/3 of 20dB bandwidth of hopping channel

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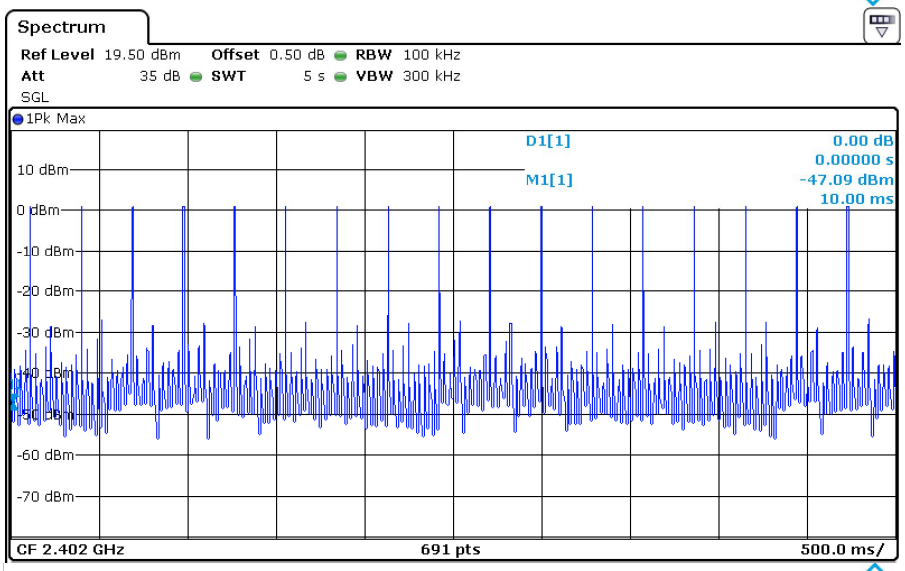
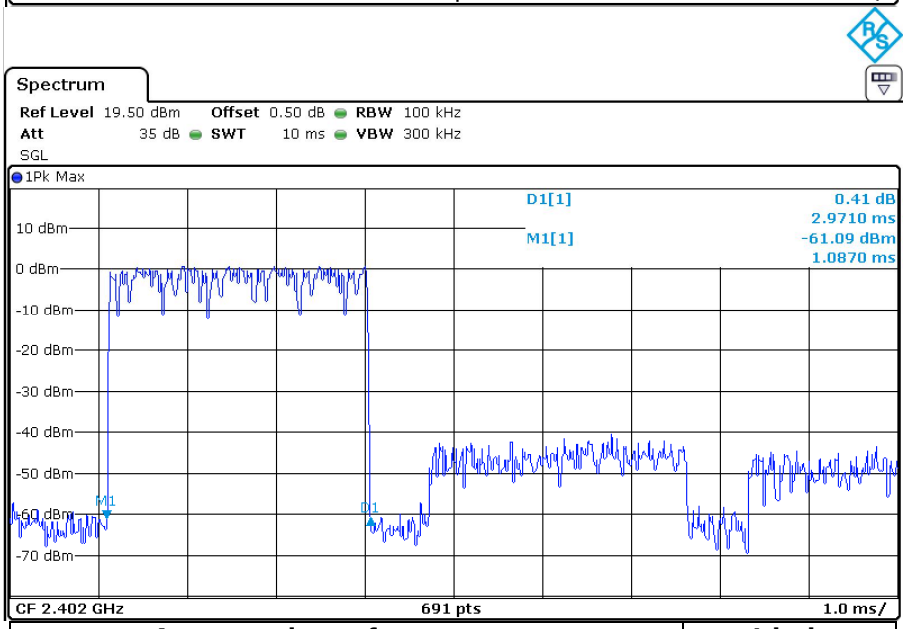
7.8 Average Channel Occupancy Time

EUT: HG02924
Op Condition: Operated, TX Mode (2402MHz)
Test Specification: FCC15.247(a)(1)
Comment: 3.7VDC

Test Result
☒ Passed
☐ Not Passed





Average time of occupancy	Limit
Number of hops in 5 sec.: 17 Period: 0.4 x 79 Ch. = 31.6 sec. Total number of hops in 31.6 sec.: (17/5)*31.6=108 Time of single pulse: 2.971 ms Average time of occupancy: 2.971 ms x 108 = 0.3208 sec.	0.4 Seconds

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7.9 Antenna Requirement

EUT:	HG02924
Op Condition:	Operated, TX Mode
Test Specification:	FCC15.203 & 15.247(b)
Comment:	3.7VDC

Test Result
☒ Passed
☐ Not Passed

Limit

For intentional device, according to FCC Title 47 Part 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. And according to FCC Title 47 Part 15.247(b), if transmitting antennas of directional gain greater than 6 dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

Antenna Connector Construction

The antenna used in this product is PCB antenna, and the maximum gain of this antenna is 0.0 dBi.

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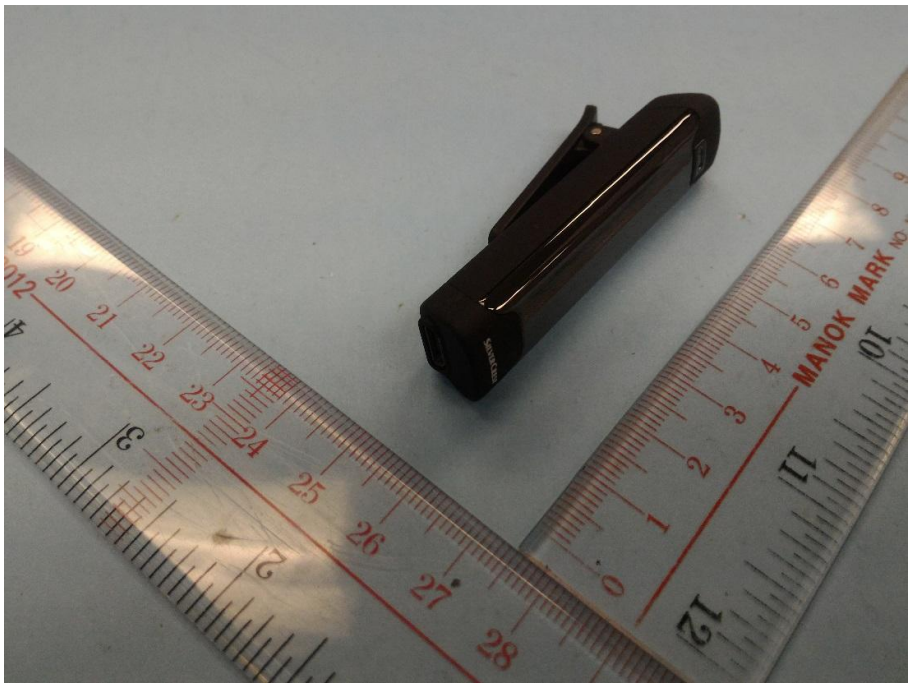
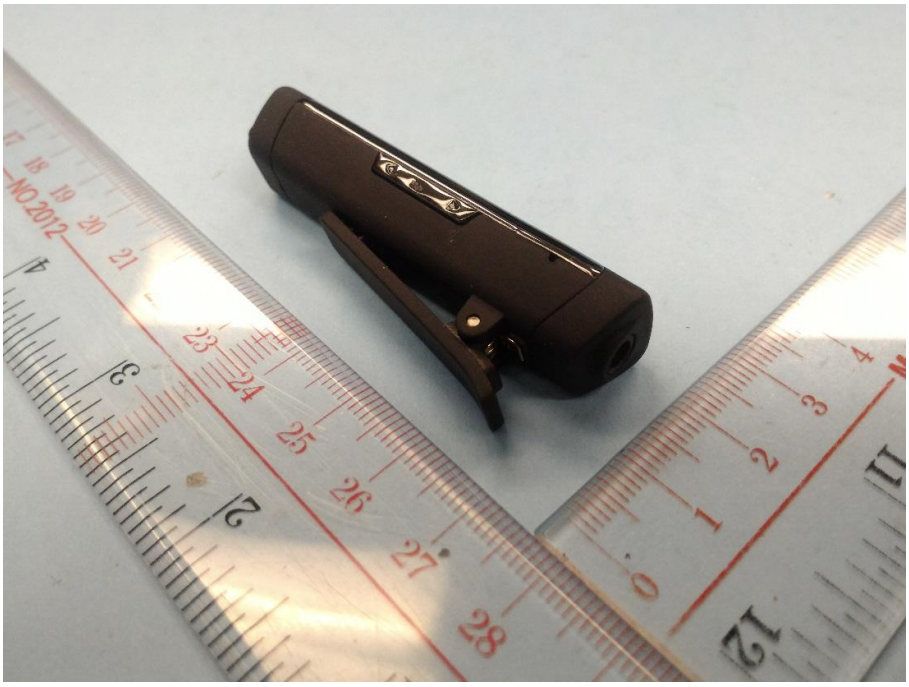
8 Appendix A - Photographs of EUT



China

Appendix A



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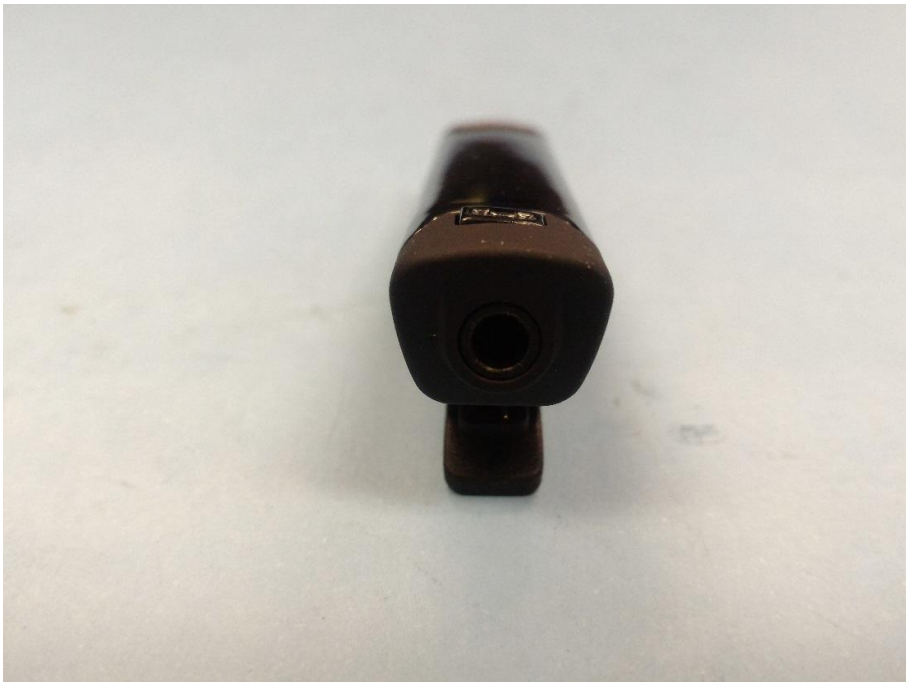
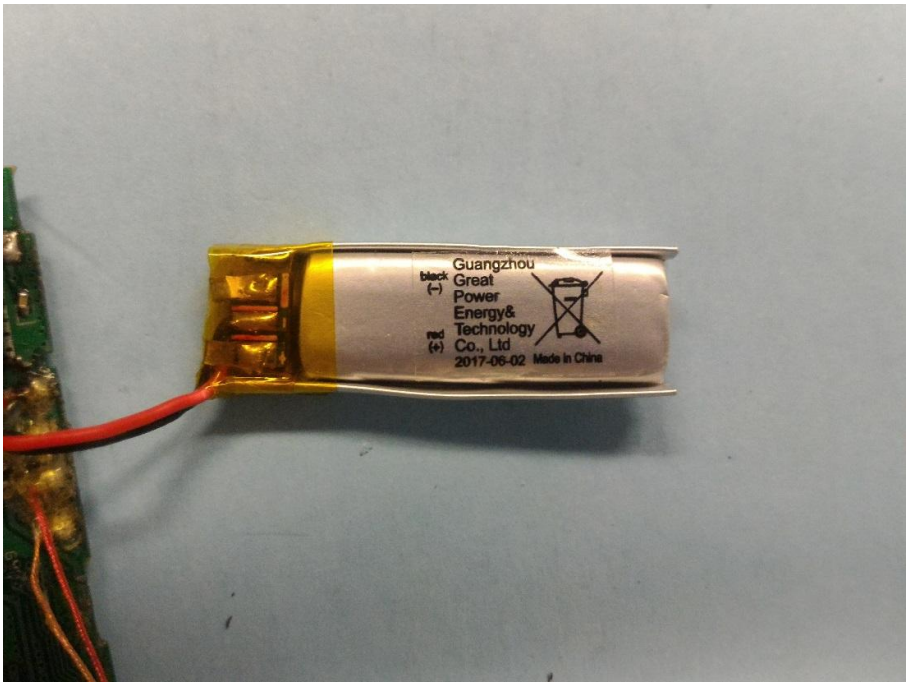
Appendix A



China

Appendix A



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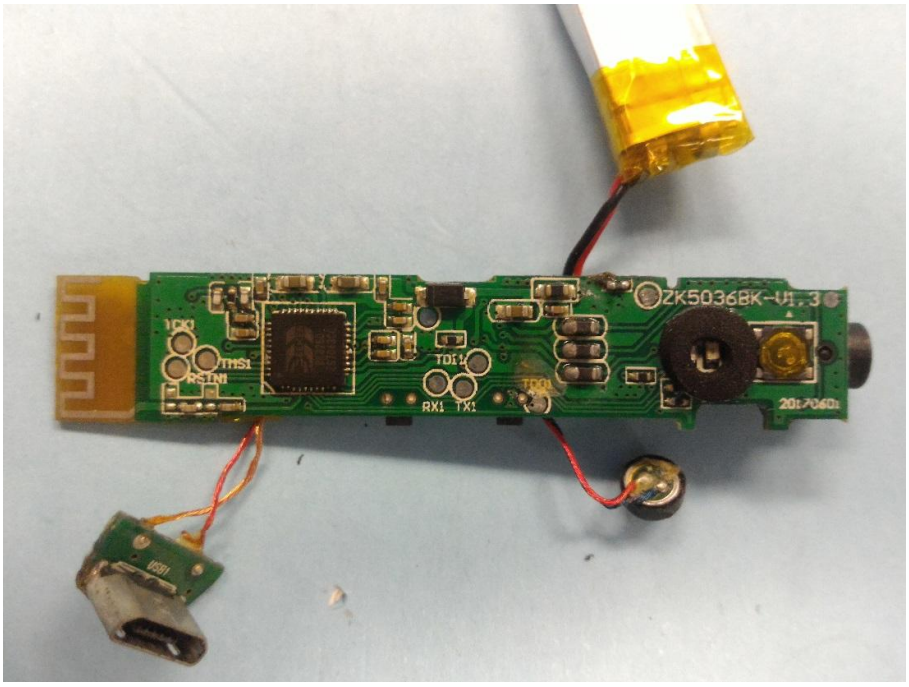

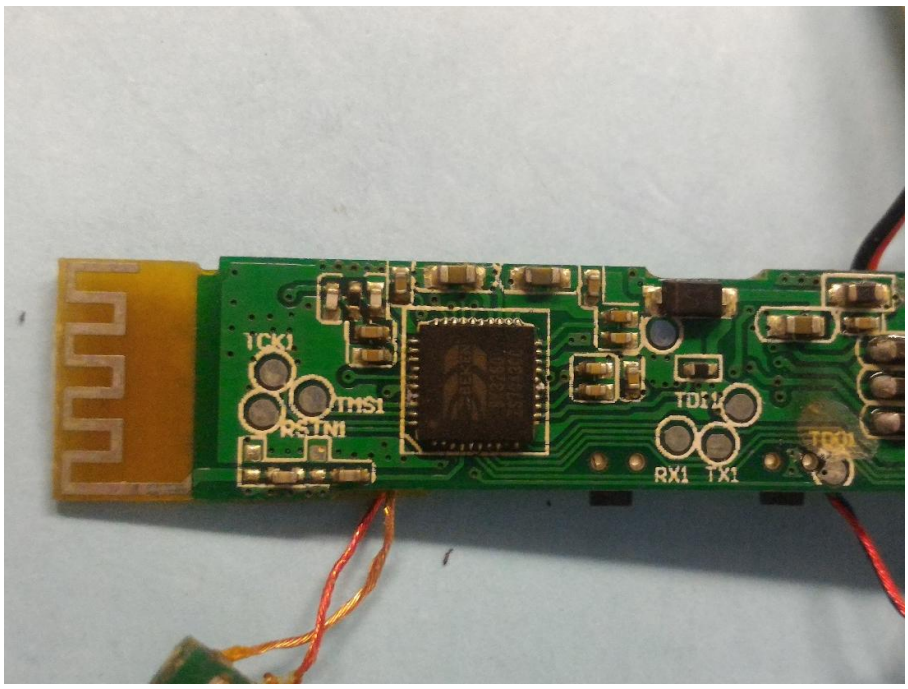

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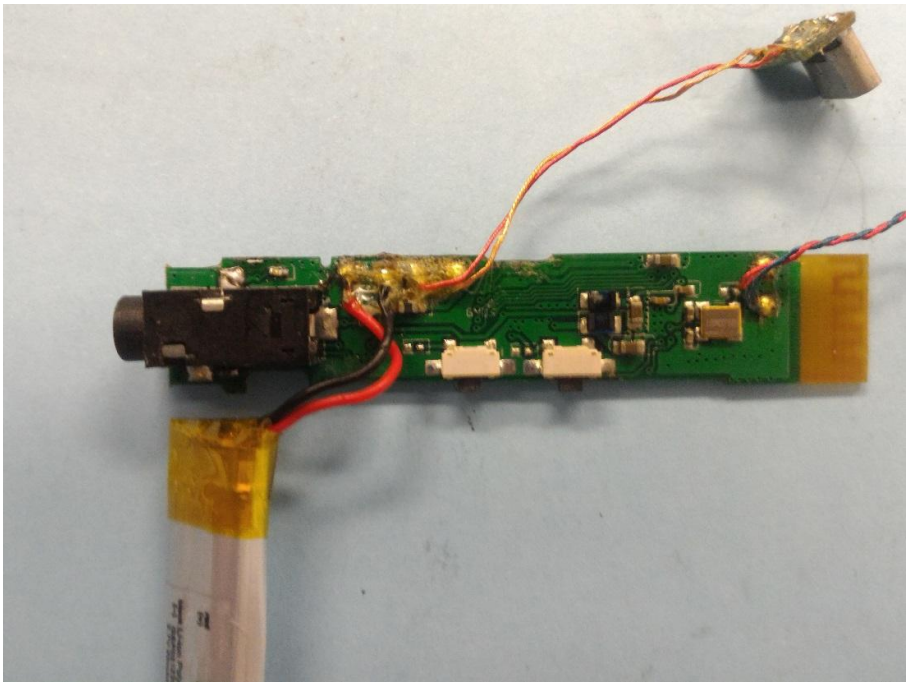

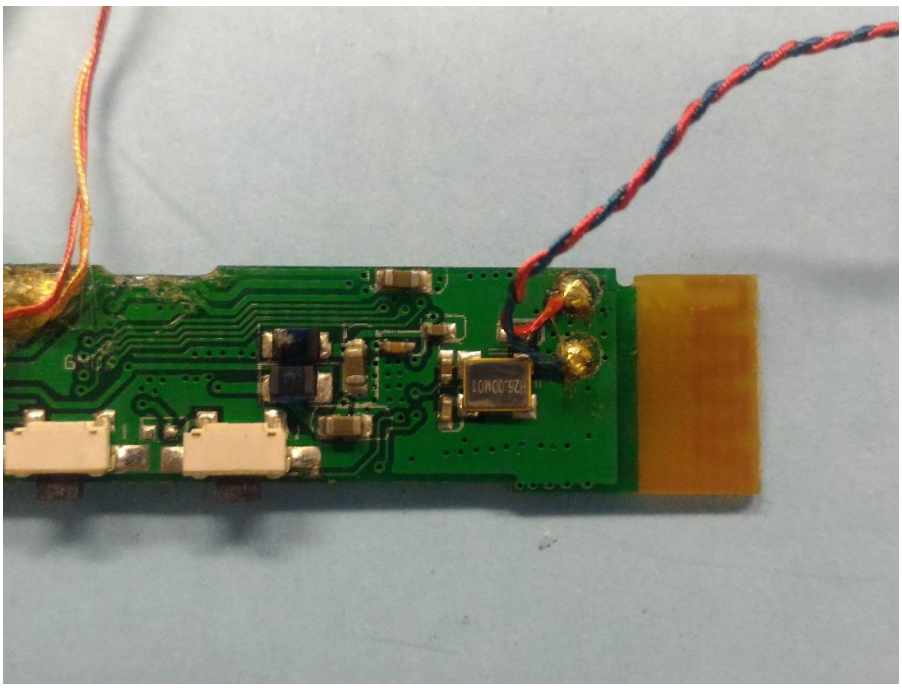

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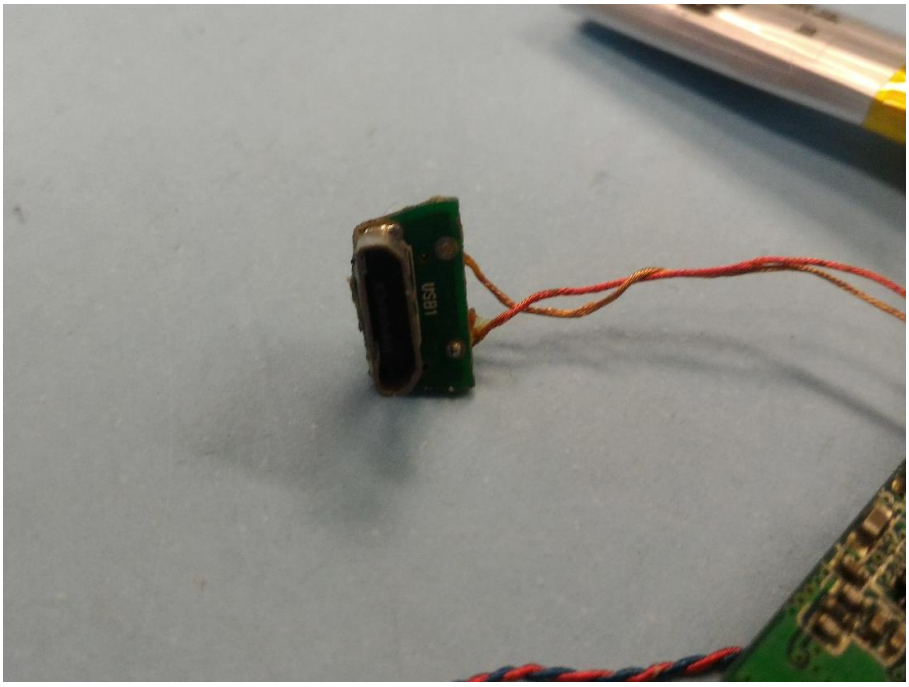
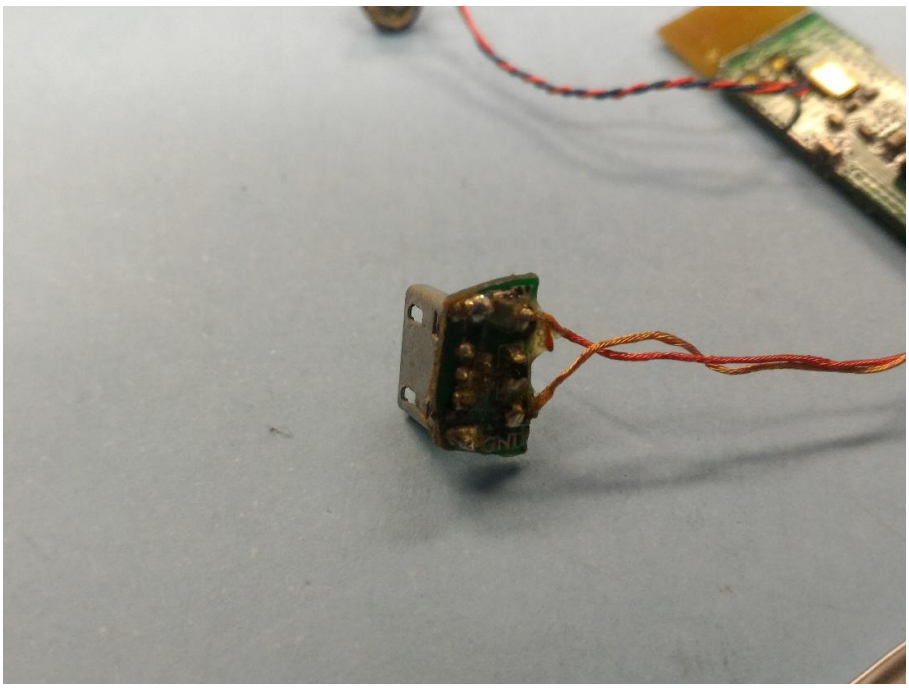
Appendix A





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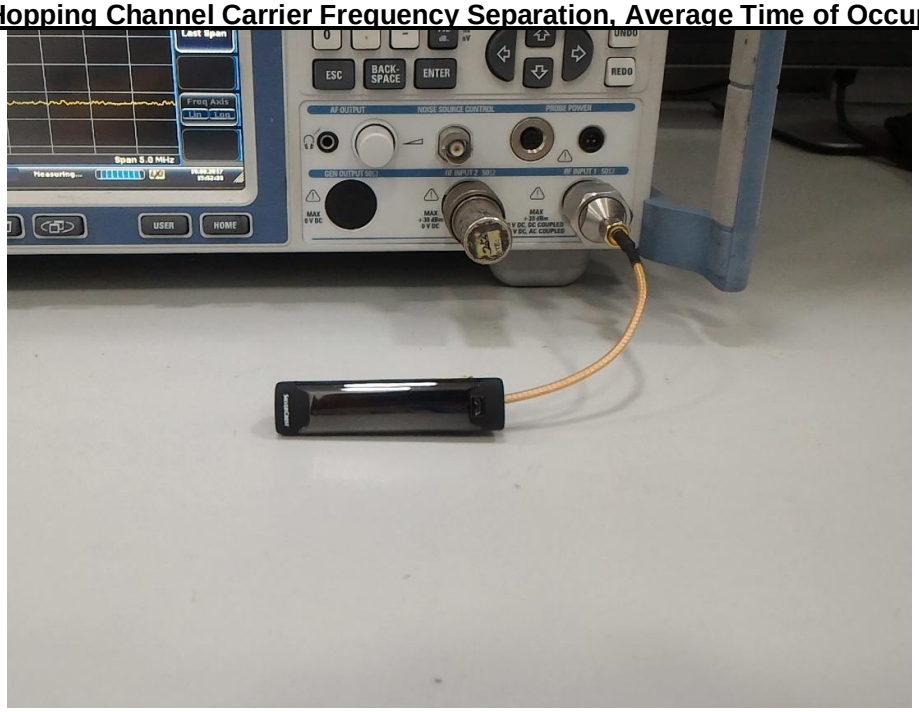
9 Appendix B - Setup Photographs of EUT

Spurious Radiated Emission

20dB & 99% Bandwidth, Peak Output Power,
Spurious Emissions at Antenna Terminals,
100kHz Bandwidth of band edges, Min. No. of Hopping Frequencies,
Min. Hopping Channel Carrier Frequency Separation, Average Time of Occupancy



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10 Appendix C - General Product Information

Radiofrequency radiation exposure evaluation

According to KDB 447498 D01v06 section 4.3.1, For frequencies between 100 MHz to 6GHz and test separation distances ≤ 50 mm, the Numeric threshold is determined as

Step a)
[(max. power of channel, including tune-up tolerance, mW) / (min. test separation distance, mm)] · [√f(GHz)] ≤ 3.0 for 1-g SAR

>> The fundamental frequency of the EUT is 2402-2480MHz,
the test separation distance is ≤ 50mm.
(Manufacturer specified the separation distance is: 5mm)

Step a)
>> Numeric threshold (2402MHz), mW / 5mm * √2.402GHz ≤ 3.0
Numeric threshold (2402MHz) ≤ 9.678mW

>> Numeric threshold (2440MHz), mW / 5mm * √2.441GHz ≤ 3.0
Numeric threshold (2440MHz) ≤ 9.601mW

>> Numeric threshold (2480MHz), mW / 5mm * √2.480GHz ≤ 3.0
Numeric threshold (2480MHz) ≤ 9.525mW

>> The power of EUT measured (2402MHz) is: 1.41dBm = 1.48mW
The power of EUT measured (2440MHz) is: 1.29dBm = 1.11mW
The power of EUT measured (2480MHz) is: 1.17dBm = 0.69mW
Which is smaller than the Numeric threshold.
Therefore, the device is exempt from stand-alone SAR test requirements.

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